

A NEW SPECIES OF *MENTZELIA* SECTION *BARTONIA* (LOASACEAE)
FROM THE GREAT BASIN DESERT OF CALIFORNIA AND NEVADA

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ABSTRACT

A new species, *Mentzelia inyoensis* H.J. Thoms. & Prigge from Inyo and Mono counties, California and Churchill and Esmeralda counties, Nevada is described and illustrated. Based on chromosome number and floral and seed morphology, we consider *M. inyoensis* to be closely related to a group of species that include *M. candelariae*, *M. oreophila*, *M. leucophylla*, and possibly *M. pumila*.

Key Words: *Mentzelia*, *Mentzelia inyoensis*, Loasaceae, Great Basin.

Several collections of *Mentzelia* from Inyo and Mono counties, California and Esmeralda and Churchill counties, Nevada have been noted as being distinct but have never been formally described. Some of these collections passed as *M. multiflora* until H. J. Thompson and Joyce Zavortink realized that they were a new species. The earliest collection of this undescribed species was by K. Brandegee in 1913, reportedly from the east slope of the Sierra Nevada. This collection site has never been relocated. Then in 1949, P. A. Munz (Munz 13565, RSA) collected the new species in Silver Canyon, White Mountains, Inyo County.

The name was used as a *nomen nudum* in the *Jepson Manual* (Prigge 1993), and this publication legitimizes the name.

Mentzelia inyoensis H.J. Thoms. & Prigge, sp. nov. (Fig. 1). TYPE: USA, California, Inyo County, White Mountains, Silver Canyon, in wash at about 1935 m (6350 ft), 5 June 1968, J. Zavortink 3163 (chromosome voucher; Holotype: RSA; Isotypes: LA, MO, and NY).

Mentzelia candelariae similis sed petiolis longioribus (11–18 mm vice 6–10 mm) et stylis longioribus (10–13 mm vice 5–7 mm) et capsulis longioribus (12–25 mm vice 8–15 mm) et seminibus plus minusve parvis (2–3 mm vice 2.5–3.5 mm) atque papillis paucioribus per cellulas testae (2–6 vice (9–15) differt.

Erect perennials to 40 cm tall, densely vested with straight, retrorsely barbed hairs, the barbs in whorls of 3–6 including terminal whorl; stems several, from near the base, white. Rosette leaves lanceolate or oblanceolate, 4–11 cm long, 6–20 mm wide, crenate or irregularly and bluntly lobed, petiolate; cauline leaves lanceolate to linear-lanceolate, 6–10 cm long, 4–16 mm wide, sessile on lower stem and grading to clasping toward inflorescence; margins lobed; lobes blunt on lower leaves, narrow-

er and pointed on upper leaves. Flowers axillary or terminal, subtended by a bract; bract linear, entire or with a pair of short basal lobes or teeth; calyx lobes narrowly triangular, acuminate, 4.5–12 mm long, 1.3–3.2 mm wide; petals 5, yellow, elliptic to oblanceolate, 11–18 mm long, 2.2–4.0 (–6) mm wide, acute; petaloid staminodia 0; stamens numerous, 5–15 mm long, diminishing in length in inner whorls; anthers 0.6–1.4 mm long; filaments of the outermost whorls to 1.5 mm wide, becoming narrower in inner stamen whorls; style 10–13 mm long. Capsules straight, cylindrical, 12–16 (–25) mm long, 6–8 mm wide. Seeds lenticular, 2.0–3.0 mm long, 1.6–2.2 mm wide, narrowly winged, uniformly tannish or faintly tessellate; seed coat cells with straight radial wall and 2–6 papillae (Fig. 2), $n = 11$.

Mentzelia inyoensis has been collected from several substrates and habitats (carbonate rocks and gravel of scree slopes, washes, and canyon bottoms; calcareous pumice sand, whitish ash deposits, and clayey hillsides) and from sagebrush scrub, shadscale scrub, and pinyon-juniper woodland vegetation.

PARATYPES: USA, California, Inyo Co: White Mountains, Silver Canyon, 1981 m (6500 ft), P.A. Munz 13565 (RSA!); Silver Canyon, in wash at about 1953 m (6350 ft), J. Zavortink 3464 (LA!); Sierra Nevada(?), Andrew's Camp, near Bishop, K. Brandegee s.n. (RSA!, UC). Mono Co: White Mountains, 1.2 mi. N, 40°E of Red Mountain, Fishlake Valley drainage, 1661 m (5450 ft), T4S R35E S3, J.D. Morefield 3061 (NY, RSA!). Nevada. Churchill Co: 0.4 air miles SSE of junction of hwy 50 and 2, T17N, R36E, sec. 31, 1463 m (4800 ft), A. Tiehm, P. Lott, and J. McCormick 5824 (LA!, NY), A. Tiehm and B. Prigge 10764 (chromosome voucher; LA!), B. Prigge and A. Tiehm 7308 (LA!). Esmeralda Co: White Mts., Busher Creek Campground, 1.5 mi NE 25° of Juniper Mt. summit, T3S R35E S7, 1707 m (5600 ft), J.D. Morefield 4005 (LA!, NY, RSA!).

As an aid to the identification of *Mentzelia* (section *Bartonia*) from the Intermountain Region of

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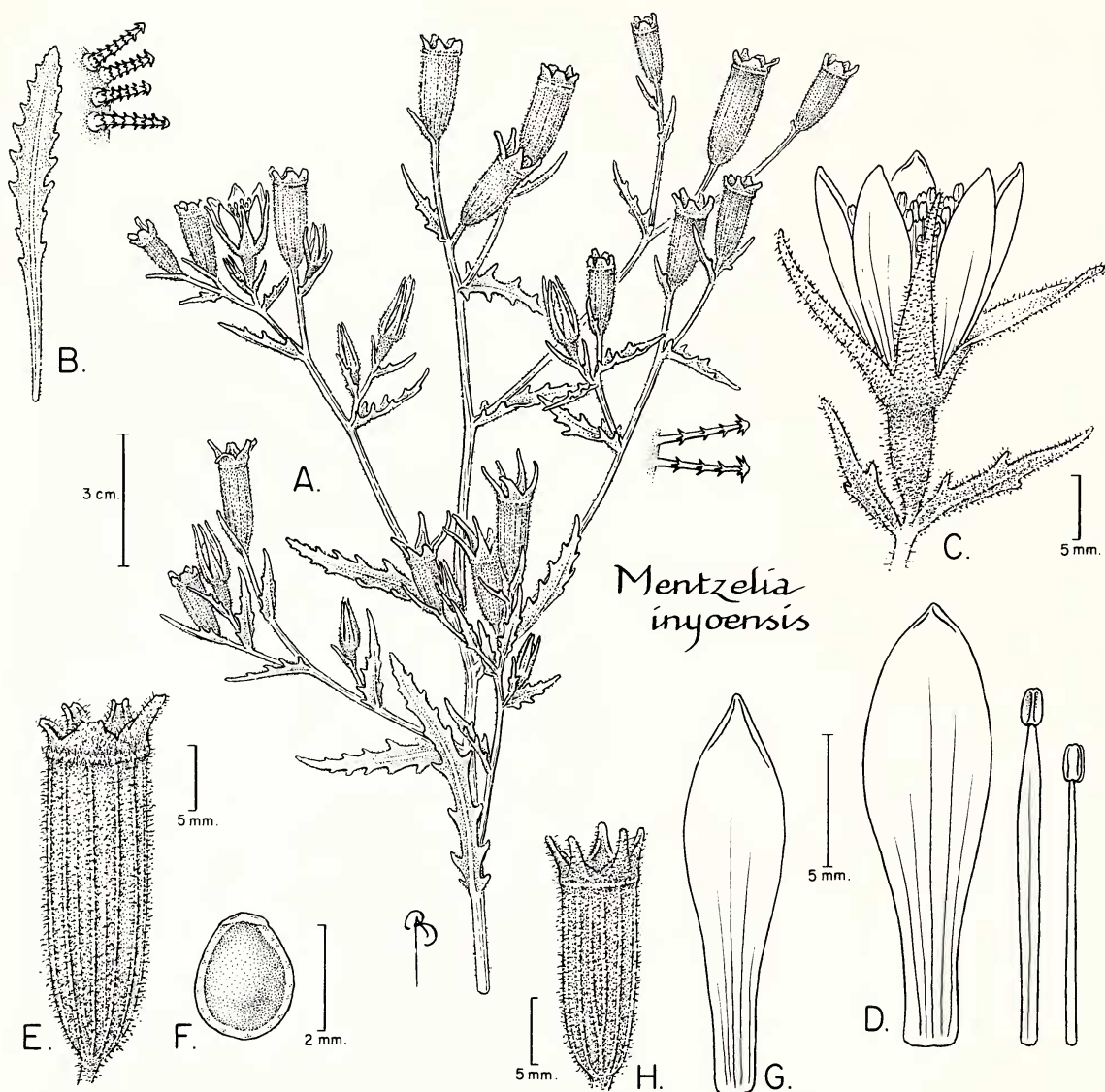


FIG. 1. *Mentzelia inyoensis*. A) portion of mature plant with buds, flowers, and fruits and detail of barbed hairs from stem; B) cauline leaf with detail of barbed pubescence; C) lateral view of partially opened flower; D) series showing petal, a stamen from outermost whorl, and a stamen from an inner whorl; E) fruting capsule; F) seed with narrow wing; G) petal; and H) immature capsule.

California and Nevada, we present a species \times character matrix (Table 1) using mostly some diagnostic characters. The species in the table are ordered so that species with characters that match more closely with those of *M. inyoensis* are placed closer to that species. In ordering the species, we emphasized characters of the seed coat, especially the radial wall, chromosome number (ignoring the count for *M. leucophylla*, see footnote 5 in Table 1), petaloid staminodia, and petaloid stamens. The other characters in the table also contributed to species ordering but most of the ordering was accomplished by the emphasized characters.

Radial wall shape and surface papillation of seed coat cells have proven to be useful characters for defining and identifying many species of *Mentzelia* section *Bartonia* (Hill 1976; Thompson and Prigge 1984, 1986; Prigge 1986; Christy 1997; Holmgren and Holmgren 2002). However, these characters are perhaps less useful in the California and Nevada portions of the Intermountain Region because most of the species have straight radial walls and several species have poorly defined papillae or sometimes a covering layer that obscures the papillae, both of which makes counting the number of papillae difficult.

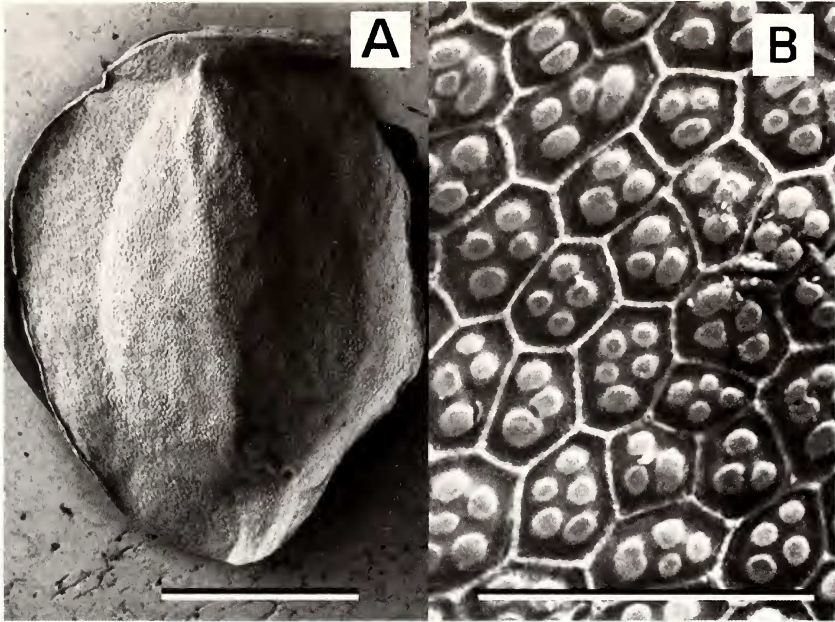


FIG. 2. Scanning electron micrographs of *Mentzelia inyoensis* seed: A) whole seed, hilum at top, bar = 1 mm; B) seed surface features showing straight radial walls of seed coat cells and 2–5, well defined papillae per cell, bar = 100 μ m. Seed is from Zavortink 3164 (collected from the type locality).

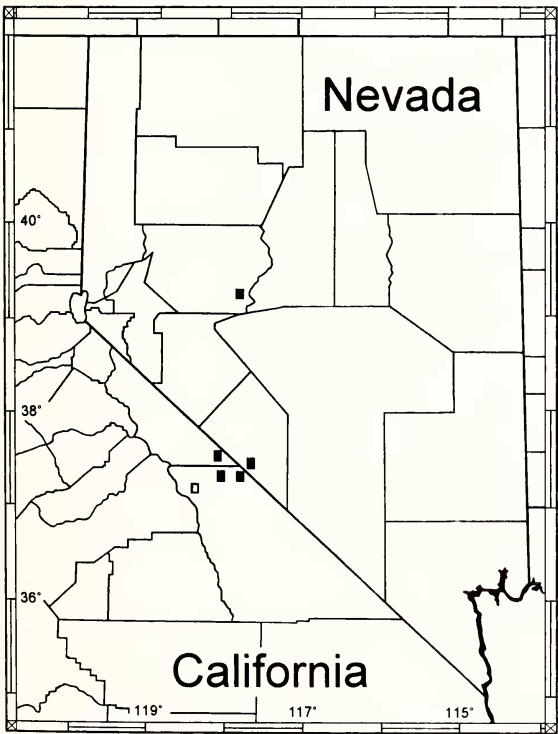


FIG. 3. Distribution of *Mentzelia inyoensis* (■). Brandegee's collection from Andrew's Camp in the Sierra Nevada (□), a location we regard as questionable, see text for further comments.

As shown in Table 1, *Mentzelia inyoensis* is very similar to *M. candellariae* and is part of a group of *Mentzelia* species that have a chromosome number of $n = 11$, a seed morphology where the seed coat cells have straight radial walls, the petals are glabrous except for a few hairs at apex (pubescent petals occur in *M. cronquistii* H.J. Thoms. & Prigge and *M. marginata* (Osterh.) H.J. Thoms. & Prigge of Utah and Colorado), and petaloid staminodia are absent. In Wyoming and northeastern Utah, another species that lacks petaloid stamens and has few papillae on the seed coat cells, commonly identified as *M. pumila* (Nutt.) Torr. & A. Gray, may prove to be more similar than *M. candellariae*. However, its seed morphology may not be typical of *M. pumila* and may be indicative of another undescribed species. More field work and a careful evaluation of the type material are necessary before this can be resolved.

Mentzelia inyoensis is believed to be restricted to the Reno and Tonopah floristic regions of the southwestern Great Basin (Holmgren, 1972) and is currently known from only five general localities (Fig. 3). A sixth collection by K. Brandegee in 1913 from Andrew's Camp near Bishop is an uncertain location. The only Andrew's Camp that we have found near Bishop is in the Sierra Nevada on Bishop Creek. Attempts by J. Zavortink and us to collect this species in the drainage of Bishop Creek were unsuccessful. According to Lloyd & Mitchell (1973), K. Brandegee also collected in Silver and Coldwater canyons in the White Mountains in

TABLE 1. MATRIX OF CHROMOSOME NUMBERS AND FLORAL, FRUIT, SEED, AND LEAF CHARACTERISTICS FOR SPECIES OF *MENTZELIA* SECTION *BARTONIA* FROM THE INTERMOUNTAIN FLORA OF CALIFORNIA AND NEVADA. Abbreviations: br. = broadly; nar. = narrowly, unk. = unknown. ¹ Chromosome counts are those reported on herbarium and annotation labels of specimens at LA (mostly counted by H.J. Thompson) and from Thompson (1963) unless noted otherwise. ² This term, following Brown and Kaul (1981) and Hufford (1989), refers to what appears to be an inner whorl of five petals but are sterile stamens with expanded filaments. ³ The outermost stamens with filaments that are greatly expanded and petal-like, i.e. the filament is as wide or nearly as wide as the petal, but bears a fertile anther. In dried material anthers are easily dislodged which can result in their appearance as petaloid staminodia. ⁴ Papillae are counted from the body of the seed; not the wings. ⁵ Reveal & Styer (1973). This count needs to be checked. We would expect a count that would fit with the aneuploid series that exists in section *Bartonia*. ⁶ From Holmgren and Holmgren (2002). ⁷ *Mentzelia laevicaulis* has an outer whorl of five distinctive stamens with an expanded filament ca 2 mm wide but not like the petals. ⁸ From Christy (1995 and 1998) and our records.

Species	Chromosome number (n) ¹	Petal length (mm)	Petaloid staminodia ²	Petaloid stamens ³	Capsule		
					Shape	Length (mm)	Width (mm)
<i>M. inyoensis</i> H.J. Thomps. & Prigge	11	11–18	0	no	cylindrical	12–16 (–25)	6–8
<i>M. candalariae</i> H.J. Thomps. & Prigge	11	6–10	0	no	bowl-shaped to subcylindrical	8–15	5–8
<i>M. oreophila</i> J. Darl.	11	7–14 (–17)	0	yes	br. bowl-shaped	5.5–6.5	6–7.5
<i>M. leucophylla</i> Brandegee <i>sensu</i> <i>stricto</i>	18 ⁵	10–11	0	yes	br. bowl-shaped	5–10	7.5–8.2
<i>M. tiehmi</i> N.H. Holmgren & P.K. Holmgren ⁶	unk.	7–15	0	yes	bowl-shaped	5–9	4–6 (–7)
<i>M. argillicola</i> N.H. Holmgren & P.K. Holmgren ⁶	unk.	8.5–15	0	yes	deeply bowl- shaped	5.5–10	4–5.5
<i>M. polita</i> A. Nelson	11	7–13	0	yes	bowl- to short barrel-shaped	5–10	6–9
<i>M. pterosperma</i> Eastw.	11	9–24	5	yes	bowl- to barrel- shaped	8–15	6–10
<i>M. laevicaulis</i> (Doug. ex Hook.) Torr. & Gray	11	40–80	0	no ⁷	cylindrical	24–45	10
<i>M. integra</i> (M.E. Jones) Tidestr.	10	8–20	5	yes	bowl-shaped to thick cylindri- cal	8–18	5–10
<i>M. multiflora</i> (Nutt.) Torr. & A. Gray ⁸	9 (10)	9–25	(0) 5 (10)	yes/no	cylindrical, barrel- or bowl-shaped	10–20	5.5–8.5

1913, and we believe she may have collected *Mentzelia inyoensis* from one of these canyons (probably Silver Canyon). She also collected at McGee Meadows, Birch Creek, and Red Hill (west of Bishop) at the end of June or start of July, 1913 (see http://mip.berkeley.edu/www-apps/smasch/smasch_accession.html and search for Inyo County, Brandegee, and 1913) and one of these areas may also be where she collected *M. inyoensis*. Although we regard her specimens of *M. inyoensis* as mislabeled, someone may eventually find it in the vicinity of Bishop Creek or elsewhere in the Sierra Nevada and thereby confirm its occurrence in that mountain range.

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TABLE 1. EXTENDED.

Seed				Lower Cauline Leaf		
Length (mm)	Wing width (mm)	Coat		Length (cm)		
		Radial walls	Papillae per cell ⁴		Outline	Margins
2.0–3.0	0.2–0.5	straight	2–6	6–10	lanceolate to linear lanceolate	lobed
2.5–3.5	0.3–0.6	straight	9–15	2–10	linear lanceolate	irregularly dentate, shallowly lobed, entire
2.7–2.9	0.4–0.9	straight	3–7	<9	elliptic to ovate	undulately toothed
2.8–3.8	0.4–0.9	straight	6–15	2.4–10	lanceolate to oblanceolate, ovate	br. and shallowly round toothed
2.2–2.5	0.1–0.3	straight	15–40	1.5–5	oblanceolate	weakly lobed to subentire
2.0–2.4	0.1 (–0.2)	straight	5–8	2–3.7	nar. oblanceolate	undulate toothed or shallowly lobed
2.5–3.0	0.5–0.8	straight	4–13	<7	nar. oblanceolate, linear, nar. lanceolate	gen entire (or with a small rounded tooth)
3.0–4.0	0.8–1.1	straight	10–15	<6 (9)	oblanceolate or obovate to br. lanceolate	crenate, toothed, or entire
2.0–4.0	0.4–0.5	straight	3–5	5–15	lanceolate to oblanceolate	lobed
2.5–4.0	0.5	wavy	6–10	<13	nar. elliptic to lanceolate	entire or undulately toothed or shallowly lobed
2.0–4.0	0.4–1.0	sinuate	∞	<15	nar. elliptic to lanceolate (oblanceolate)	toothed to lobed, sometimes pinnatifid

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